John Dunham and Associates

"The Winning Side of Economics"

Testimony of

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Results of JDA Model Created for NMOGA

- Cost of the Ozone Precursor Rule on Industry: $3.249 billion

- Cost of the Rule over 5-years: $3.852 billion
- NPV of Cost over 5-years: $3.830 billion

- Effect of the Ozone Precursor Rule on Production: 15 percent Loss
- Reduction in Oil Production: 12.9 percent
- Reduction in Natural Gas Production 22.8 percent

- Cost of the Ozone Precursor Rule on the Economy:

	Jobs		Wages		Economic Output
Direct	(1,207)	$	(108,284,469)	$	(358,590,607)
Supplier	(623)	$	(39,377,218)	$	(119,562,267)
Induced	(1,387)	$	(62,141,272)	$	(196,006,679)
Total	(3,217)	$	(209,802,960)	$	(674,159,553)

State and Local Business and Personal Taxes	$	(22,862,830)

Model Assumptions: 1

•All models are based on both their assumptions and their structure. Model can be revised by simply changing these assumptions and rebalancing.

	Oil	Natural Gas	Total
Number of Wells			
High Production	34	219	253
Medium Production	7,089	17,550	24,639
Low Production	26,170	33,185	59,355
Total Wells	33,293	50,954	84,247

Production	Barrels	Million (Cu Ft)	
High Production	12,825,551	227,148.7	
Medium Production	262,880,023	1,473,358.6	
Low Production	103,403,426	349,916.6	
Total Production	379,109,000	2,050,424.0	
Prices	$56.14	$2,856.67	
Revenue	$21,281,915,563	$5,857,377,893	$27,139,293,457

•Model does not account for wet gas production or for ancillary methane produced from primary oil wells

•Sources:

OCD Well Statistics, State of New Mexico, Oil Conservation Division, January 28, 2021 at: www.emnrd.state.nm.us/OCD/statistics.html.
Distribution and Production of Oil and Gas Wells by State, http://www.eia.gov/pub/oil_gas/petrosystem/petrosysog.html. Data retrieved 05/06/2014

Model Assumptions: 2

- Oil and natural gas prices taken from US Department of Energy, EIA
  - Oil first purchase price March 2021 average
  - Natural gas citygate price January 2021 average

- Wage rates from US Department of Labor, BLS May 2020 State Occupational Employment and Wage Estimates: New Mexico

- Discount rates are from ICE BofA US High Yield Index Option-Adjusted Spread, Ice Data Indices, LLC, retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/BAMLH0A0HYM2, June 10, 2021.

- Operational costs are from a survey of 10 companies conducted by the NMOGA

Cost Model Structure

•Model developed for Western Energy Alliance in 2018.

•Updated to reflect outlined assumptions
•Examines cost of developing primary oil or natural gas well including:

Exploration	Completion	Remediation
Permitting	Production	
Drilling	Transportation to Distribution	

•Cost structure from IMLAN Input/Output Model New Mexico 2016 tables

•Revenue numbers assume exponential decline in production with 80 percent occurring in first 4 years and facility lifespan of 20 years

•Model calculates average profit margin for base state operation

•Additional costs shock the system and it is rebalanced to prior profit margin by shutting down one well at a time starting with the least profitable and moving to the next and the next etc.

Economic Impact Model Structure

•Baseline economic impact from industry impact model produced for Western Energy Alliance in 2018 (Impact has not been updated since then).

•Data on physical location and employment of all oil and natural gas operations in the western states used as inputs to the model.

•Supplier and Induced impacts based on IMPLAN state and national models: 2016 tables.

•Baseline shocked by -15.0 percent which is equal to the percentage loss in revenue calculated by the well cost model.

•Direct industry jobs fall by 15.0 percent. Supplier industry jobs fall by calculated loss in direct output, and induced jobs fall by calculated loss in direct+supplier wages.

SURREBUTTAL

Response To Rebuttal Testimony Of Susan Day and Brian Palmer

•Rebuttal testimony claims that New Mexico only has 47,937 oil and natural gas wells that would be subject to the rule

•Rebuttal testimony claims that the 5-year cost to the oil and natural gas industry would be $1.7 billion.

•Running the model with these numbers projects:

- The loss of 40.97% of currently operating oil and natural gas wells
- A reduction of 7.10% of oil production
- A reduction of 13.5% of natural gas production
- A reduction of 9.48% of New Mexico's baseline petroleum production in value terms

•Significant Economic Losses

	Jobs	Wages	Economic Output
Direct	(756)	$ (68,004,339)	$ (225,154,533)
Supplier	(391)	$ (24,724,460)	$ (75,071,644)
Induced	(871)	$ (39,023,566)	$ (123,088,556)
Total	(2,019)	$ (131,752,364)	$ (423,314,733)

State and Local Business and Personal Taxes	$ (14,355,908)

Response To Rebuttal Testimony Of Susan Day and Brian Palmer

- NMED complains that costs are overestimated.
  - My analysis relies on cost data provided by actual oil and natural gas companies via the NMOGA.
  - Other witnesses will testify about the inadequacy of ERG and NMED cost estimates throughout this hearing.
  - Even using the agency well data and cost numbers, the impact is still significant.
  - Even the NMED witnesses suggest that the rule would cost at least $1.7 billion.
- EDF suggests that the report does not acknowledge the limitations of input-output models.
  - These are standard models used by government and economists to calculate how products are produced and how changes to production functions effect output.